

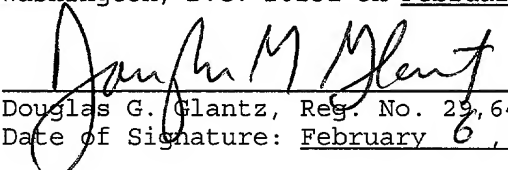
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Applicants: Chu et al. ) Atty. Dock.: 46AA  
Serial No.: ) Examiner:  
Filed: February 7, 2002 ) Art Unit:  
For: Uniformly dispersed, )  
finely sized ceramic )  
particles in metals )  
and alloys )

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail No. EF223507330US in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on February 7, 2002.

  
Douglas G. Glantz, Reg. No. 29,640  
Date of Signature: February 6, 2002

Assistant Commissioner of Patents  
Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

**PRELIMINARY AMENDMENT**

Please enter the following preliminary amendment in the above-identified application.

In the Title:

Please change the Title to the following: --Aluminum Alloy Product Refinement and Applications of Aluminum Alloy Product Refinement--.

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In the Specification:

In the first line after the Title, insert --This application is a Divisional of prior co-pending U.S. Application USSN 09/523,883 filed March 13, 2000--.

In the Claims:

Please amend the Claims as follows:

Please cancel the previous Claims in the case (1-24), without prejudice, and add the following new Claims:

25. An aluminum alloy product having preferred mechanical properties formed by the process of:

- (a) providing a metal matrix of aluminum;
- (b) providing said metal matrix in a liquid state containing a liquid titanium;
- (c) reacting a salt bath containing a carbon with said liquid titanium element to form a uniform distribution of finely sized titanium carbide ceramic phase particles formed and dispersed in-situ uniformly in said aluminum metal matrix; and
- (d) providing an aluminum alloy product having preferred mechanical properties formed from said uniform distribution of finely sized titanium carbide ceramic phase particles formed and dispersed in-situ uniformly in said aluminum metal matrix.

26. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 25, wherein said providing an aluminum alloy product having preferred mechanical properties comprises providing an uncrystallized structure during a deformation operation.

27. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 25, comprising increasing dispersion strengthening in said aluminum alloy product having preferred mechanical properties.

28. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 26, wherein said uniform distribution consists of a substantially cluster-free distribution of no more than two particles attached to one another at a magnification of 500X.

29. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 28, wherein said finely sized ceramic phase particles comprise titanium carbide particles having an average particle diameter of less than about 1 micron formed and dispersed in situ in said aluminum metal matrix.

30. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 29, wherein said finely sized ceramic phase particles comprise titanium carbide particles having an average particle diameter of less than about 0.3 micron formed and dispersed in situ in said aluminum metal matrix.

31. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 30, wherein said aluminum alloy product having preferred mechanical properties comprises a high strength, light weight aluminum alloy having a high strength to weight ratio.

32. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 30, wherein said aluminum alloy product having preferred mechanical properties comprises an aluminum airframe.

33. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 30, wherein said preferred mechanical properties comprise a property selected from the group consisting of increased recrystallization temperature, decreased grain growth in hot working, and elevated temperature strength.

34. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 25, wherein said uniform distribution of finely sized titanium carbide ceramic phase particles formed and dispersed in-situ uniformly in said aluminum metal matrix provide increased nuclei for grain refining in said aluminum metal matrix.

35. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 27, wherein said uniform distribution consists of a substantially cluster-free distribution of no more than two particles attached to one another at a magnification of 500X.

36. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 35, wherein said finely sized ceramic phase particles comprise titanium carbide particles having an average particle diameter of less than about 1 micron formed and dispersed in situ in said aluminum metal matrix.

37. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 36, wherein said finely sized ceramic phase particles comprise titanium carbide particles having an average particle diameter of less than about 0.3 micron formed and dispersed in situ in said aluminum metal matrix.

38. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 37, wherein said aluminum alloy product having preferred mechanical properties comprises a high strength, light weight aluminum alloy having a high strength to weight ratio.

39. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 37, wherein said aluminum alloy product having preferred mechanical properties comprises an aluminum airframe.

40. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 37, wherein said preferred properties comprise a property selected from the group consisting of increased recrystallization temperature, decreased grain growth in hot working, and elevated temperature strength.

41. An aluminum alloy product having preferred mechanical properties formed by the process of Claim 25, wherein said uniform distribution of finely sized titanium carbide ceramic phase particles formed and dispersed in-situ uniformly in said aluminum metal matrix provide increased nuclei for grain refining in said aluminum metal matrix.


Remarks:

Claims 25-41 are in the case.

Reconsideration of this application is requested.

Respectfully submitted,

February 6, 2002  
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